

WHAT IS CLAIMED IS:

1. A liquid crystal display (LCD) panel, comprising:

a plurality of gate lines formed in the horizontal direction;

a plurality of data lines formed in the vertical direction;

a common electrode line formed in the horizontal direction between the gate lines;

a first pixel electrode formed at an odd row of an odd column and at an even row of an even column among areas formed by the data lines and the gate lines ; and

a second pixel electrode formed at an odd row of an even column and at an even row of an odd column of the areas, and

wherein a polarity of the second electrode is different from the first pixel electrode.

2. The LCD panel of claim 1, wherein the first pixel electrode is formed at an area respectively surrounded by an odd data line and its subsequent adjacent even data line and is connected to an odd gate line and its subsequent adjacent common electrode line, and formed at an area respectively surrounded by an even data line and its subsequent adjacent odd data line and is connected to an even common electrode line and its subsequent adjacent gate line, and

wherein the second pixel electrode is formed at an area respectively surrounded by an even data line and its subsequent adjacent odd data line and is connected to an odd common electrode line and its subsequent adjacent gate line, formed at an area respectively surrounded by an odd data line and its subsequent adjacent even data line and is connected to an even gate line and its subsequent

adjacent common electrode line.

3. The LCD panel of claim 1, wherein a polarity of each pixel is inverted to a different polarity per each frame.

4. A liquid crystal display (LCD), comprising:

5 a timing controller for outputting a first driving signal and a second driving signal, and outputting a third driving signal that defines periods and amplitudes according to vertical and horizontal synchronization signals and a main clock signal;

a data driver for outputting an image signal that drives a polarity of a liquid crystal capacitor based on the first driving signal;

10 a gate driver for outputting a scanning signal based on the second driving signal;

a driving voltage generator for receiving the third driving signal, raising or lowering levels of the third driving signal, and outputting a common electrode voltage that is swung and synchronized with the image signal in a predetermined period; and

15 an LCD panel for displaying the image signal in cooperation with the common electrode voltage and the scanning signal in an independent wiring structure that forms gate lines in the horizontal direction and common electrode lines between the gate lines.

5. The LCD of claim 4, wherein the LCD panel comprises:

20 a plurality of gate lines formed in the horizontal direction;

a plurality of data lines formed in the vertical direction;

common electrode lines formed in the horizontal direction between the gate

lines;

a first pixel electrode formed at an odd row of an odd column and at an even row of an even column in an area formed by the data lines and the gate lines ; and

a second pixel electrode formed at an odd row of an even column and at an even row of an odd column in the area, and

wherein a polarity of the second electrode is different from that of the first pixel electrode.

6. The LCD of claim 5, wherein the first pixel electrode is formed at an area respectively surrounded by an odd data line and its subsequent adjacent even data line and is connected to an odd gate line and its subsequent adjacent common electrode line, and formed at an area respectively surrounded by an even data line and its subsequent adjacent odd data line and is connected to an even common electrode line and its subsequent adjacent gate line, and

wherein the second pixel electrode is formed at an area respectively surrounded by an even data line and its subsequent adjacent odd data line and is connected to an odd common electrode line and its subsequent adjacent gate line, formed at an area respectively surrounded by an odd data line and its subsequent adjacent even data line and is connected to an even gate line and its subsequent adjacent common electrode line.

7. The LCD of claim 4, wherein the gate driver concurrently provides a first scanning signal to an odd pixel of an odd gate line and an even pixel of an even gate line, and a second scanning signal to an odd pixel of an even gate line and an even pixel of an odd gate line.

8. The LCD of claim 4, wherein a polarity of each pixel is inverted to a different polarity per each frame.

9. The LCD of claim 4, wherein the swung common electrode voltage is a square wave having a period identical to the image signal.

10. The LCD of claim 4, wherein the swung common electrode voltage is a square wave having a period three times longer than the period of the image signal.

11. The LCD of claim 4, wherein the data driver is a low voltage TAP IC for line inversion driving.

12. The LCD of claim 4, wherein a swing amplitude of the common electrode voltage is established as:

$$\Delta V_{com} = \frac{2(V_{max} + V_{th}) \cdot (C_{st} + C_{lc-black}) \cdot (C_{st} + C_{lc-white})}{C_{st}(2C_{st} + C_{lc-white} + C_{lc-black})}$$

where V_{max} represents the maximum value of the actual voltage sensed by a liquid crystal, V_{th} represents the minimum value of the actual voltage sensed by the liquid crystal, C_{lc} represents a liquid crystal capacitance, C_{st} represents a storage capacitance, $C_{lc-black}$ represents the liquid crystal capacitance in a black mode, and $C_{lc-white}$ represents the liquid crystal capacitance in a white mode.

13. In a liquid crystal display (LCD) including an LCD panel comprising a plurality of gate lines; a plurality of data lines; common electrode lines formed by a predetermined area made between a gate line and its subsequent adjacent gate line; a first pixel electrode formed at an odd row of an odd column and an even row of an even column in an area formed by the data lines and the gate lines; and a second pixel

electrode formed at an odd row of an even column and an even row of an odd column,
a method for driving the LCD, comprising steps of:

receiving an image signal from an external image signal source and providing
the image signal to a data line;

generating a first scanning signal and providing the same to an odd pixel of an
odd gate line and an even pixel of an even gate line;

generating a second scanning signal and providing the same to an odd pixel of
an even gate line and an even pixel of an odd gate line;

sequentially providing the first scanning signal and the second scanning signal
to the gate line; and

supplying a common electrode voltage to a common electrode line so as to
superimpose voltage to transmission (VT) curves of positive and negative polarity
driving together with the sequential providing of the first scanning signal and the second
scanning signal.

14. The method of claim 13, wherein the common electrode voltage is
synchronized with the image signal with a predetermined period and is swung.

15. The method of claim 13, wherein a swing amplitude of the common
electrode voltage is established as:

$$\Delta V_{com} = \frac{2(V_{max} + V_{th}) \cdot (C_{st} + C_{lc-black}) \cdot (C_{st} + C_{lc-white})}{C_{st}(2C_{st} + C_{lc-white} + C_{lc-black})}$$

where V_{max} represents the maximum value of the actual voltage sensed by a
liquid crystal, V_{th} represents the minimum value of the actual voltage sensed by the
liquid crystal, C_{lc} represents a liquid crystal capacitance, C_{st} represents a storage

capacitance, $C_{lc-black}$ represents the liquid crystal capacitance in black mode, and $C_{lc-white}$ represents the liquid crystal capacitance in white mode.

16. The method of claim 13, wherein a polarity of each pixel is inverted to a different polarity per each frame.